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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,384	01/16/2002	Kevin A. McCullough	P0037I-US2	7675
3017	7590	04/01/2004	EXAMINER	
BARLOW, JOSEPHS & HOLMES, LTD. 101 DYER STREET 5TH FLOOR PROVIDENCE, RI 02903			TUGBANG, ANTHONY D	
			ART UNIT	PAPER NUMBER
			3729	12
DATE MAILED: 04/01/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/050,384	MCCULLOUGH, KEVIN A.
	<b>Examiner</b>	<b>Art Unit</b>
	A. Dexter Tugbang	3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 22 January 2004.

2a) This action is **FINAL**.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-3 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/3/03 has been entered.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

3. The rejection from the previous Office Action (Paper No. 10, dated 11/18/03) is maintained and hereby repeated below for the applicant's convenience.
4. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clayton 5,661,339 in view of Takahashi et al 5,561,208.

Clayton discloses a method of manufacturing a structural frame comprising: providing a base polymer matrix and net-shape injection molding a molding material of a liquid crystal polymer into a shape of a structural frame 12 (in Fig. 1) for supporting electronic components (see col. 3, lines 5-10); providing an electronic circuit board (assembly 32, 58) having heat generating electronic components of either RAM chips or a microprocessors disposed thereon (see col. 8, lines 40-45); mounting the circuit board in direct physical contact with the structural frame with the electronic components being in thermal communication with the structural frame

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(see col. 6, lines 49-53); dissipating heat from the heat generating electronic components through the structural frame (see col. 7, lines 47-50).

Clayton does not teach mixing a thermally conductive filler material into the base polymer matrix to form a molding material having a uniform distribution filler material throughout the entire molding material.

Takahashi teaches that liquid crystal polymer materials can be mixed with a uniform distribution of a conductive material, i.e. carbon fibers (see col. 13, lines 19-40), to provide a molding material for net-shape injection molding (see col. 10, lines 10-15), which has excellent properties as a structural frame (carrier) in supporting electronic components (see col. 16, lines 55-64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Clayton by mixing a uniform distribution of a thermally conductive filler material into the base polymer matrix, as taught by Takahashi, to advantageously provide an excellent net-shape injection molding material for the structural frame that supports electronic components.

#### *Response to Arguments*

5. Applicant's arguments filed 1/22/04 (Paper No. 11) have been fully considered but they are not persuasive.

In regards to the merits of the prior art, the applicant asserts that the prior art does not teach mounting the circuit board in direct physical contact with the structural frame with the electronic component being in thermal communication with the structural frame via the circuit

board and dissipating heat from the heat generating electronic component through the structural frame. Applicant appears to place a great deal of emphasis on the aspects of “thermal communication” and “dissipating heat”.

The examiner most respectfully disagrees. The above aspects of “thermal communication” and “dissipating heat” were relied upon in Clayton. Clayton teaches an electronic module that includes both the electronic circuit board (assembly 32, 58) and the structural frame (molded frame 12). Clayton teaches that the *entire module, inclusive of the circuit board, structural frame, electronic components and cover plate*, dissipates heat through thermal convection to the surrounding atmosphere (see col. 7, lines 45-53). The dissipation of heat to the surrounding atmosphere of the entire module is what is considered to be the “thermal communication” between the circuit board, structural frame and electronic components, as the intent of Clayton is to remove heat, i.e. cool, the module. Although, Clayton does discuss the contribution of the cover plate 48, or the surface area of the cover plate dissipating heat, heat is also dissipated from, or through, the structural frame 12 *because the intent is to remove heat from the entire module* to the surrounding atmosphere.

It is noted that the feature of having the structural frame act as a “conduit” to transfer heat from the circuit board is not even recited in the rejected claims and it appears that the applicant is arguing more specifically than that which is claimed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on

obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Takahashi was relied upon for injection molding of thermally conductive filler materials into a base polymer matrix to specifically support electronic components. Takahashi realizes that the polymer materials are thermally conductive to the extent that must be able to operate in heat or elevated temperatures (see col. 4, lines 29+) and both Takahashi and Clayton share the common problems associated with thermally conductive filler materials. Therefore, the examiner maintains the combination of Takahashi and Clayton would be obvious.

### *Conclusion*

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**A. Dexter Tugbang  
Primary Examiner  
Art Unit 3729**

March 31, 2004